

# **EXHIBIT 6**

**Production and Interpretation of Aerial Photographs for the Following Fifteen Sites:**

**Assonet, MA; Bethany, CT; Brazier, Pierre County, WA; Central Chemical, Hagerstown, MD; Charleston, TN; Crab Orchard, Marion, IL; Frontier Chemical, Pendleton, NY; Middletown, CT; Morgantown, WV; New Haven Plant, New Haven, CT; Niagara County Refuse, NY; North Little Rock, AR; Olin Water Service, Kansas City, KS; Pine Swamp, Hamden, CT; and Wallisville Road, Houston, TX**

A handwritten signature in black ink, appearing to read 'Randall Grip', written over a horizontal line.

**Randall Grip**

**Aero-Data Corporation LLC**

**January 12, 2018**

## **Introduction**

Aero-Data Corporation was engaged to perform an historical aerial photography study of 15 sites. We acquired historical imagery of these sites and produced a written analysis of environmentally significant features for each. The analysis and exhibits are included as 15 chapters in this report. These observations constitute my opinions and conclusions.

## **Statement of Qualifications**

My name is Randall W. Grip. I have a Bachelor of Science Degree in Geography from Louisiana State University. I am vice-president of Aero-Data Corporation. Aero-Data specializes in aerial mapping and environmental studies using aerial photography and historical maps. Over the past 20 years, I have provided expert photo-interpretation and photogrammetry services for environmental assessment purposes. In the course of this work, I have participated in studies and obtained and interpreted aerial photographs of sites throughout the United States as well as in other foreign nations.

My expertise is in the area of review and analysis of readily available aerial photography. The processes I use include research and acquisition of stereoscopic photography, high resolution photogrammetric scanning, geo-registration of stereo images, and digital orthophoto production. I have been qualified as an expert witness in the fields of photo-interpretation and photogrammetry. My Curriculum Vitae and listing of testimony and publications (last four years) are in Attachment B and C.

## **Information Considered in Forming Opinions**

My opinion is based upon vertical stereoscopic and monoscopic aerial photography and maps of the Site as well as my experience and training. Attachment A includes a listing of the aerial photography and other information that I have relied upon.

## **Production of Geo-Registered Images**

Historical aerial photography was acquired of the Sites from public and private sources. The historical aerial photography was then registered to a common coordinate system and reviewed using digital photogrammetric workstations.

I have produced digital stereoplotter based geo-registered imagery of the stereoscopic dates of aerial photography used for this expert report. The cropped and scaled versions of the dates of aerial photography and my observations on each are also included in Attachment A.

I reserve the right to supplement this report if additional documents or material become available.

## **Methods and Materials**

### **Aerial research and acquisition**

The historical aerial photography study of the Site began with research for available photo coverage from public and private vendors. The photo coverage was then obtained in the form of frames consisting of vertical stereoscopic photography in a 9"x9" format and/or orthophotos.

### **Setting up the stereomodels**

Two or more raster images for each stereo date of photography were then imported into a digital stereoplotter capable of providing stereoscopic viewing of the images at high magnification levels. The digital stereoplotter also allows precise mapping of significant environmental features, which are interpreted, in the 3-D imagery.

Ground control consisted of mapped features, thousands of feet off the Site but which were also visible in the aerial photography, were measured (coordinates derived) from the geo-registered orthophotos and used as

ground control points for the images.

The coordinates of each selected visible ground control point were then entered into a control point file in the digital stereoplotter. The floating dot (measuring point) of the stereoplotter was carefully positioned by the operator with the hand controller, one point at a time, onto each of the visible control points and the coordinates of that point (from the ground control point file) were assigned to the image. When sufficient control points had been visited, accepted and the model checked for residual errors, the stereo model was then confirmed to be level, scaled and locked into the coordinate system. As a result, measurements of heights and distances could now be made within the stereo model area by using the digital stereoplotter.

Stereo models for each photomission were set up using ground control points derived the orthophotos and USGS maps. This assured that the stereo models for all dates were accurately registered one to another in the same coordinate system.

### **Rectified Image Production**

Next, using the stereomodels and digital stereoplotter, a rectified image was produced for each date of photography. A rectified image is a two dimensional raster image produced from one or more frames of vertical aerial photography such that most of the distortion caused by tip and tilt in the mapping camera has been removed, and the resulting raster image is registered to a coordinate system.

### **Anaglyph Images**

For stereo viewing of the aerial images while reading this report, anaglyph (3-D) images can be produced by the digital stereoplotter from the stereomodels. The anaglyph is produced by merging the two overlapping stereo images into a composite digital image with the left frame colored red and the right frame colored blue.

By viewing the anaglyph image through red and blue glasses, the composite image is separated into two slightly different images, one for each eye. This allows a reader with normal stereovision to perceive a stereo (or 3-D) view of the Site.

Anaglyph images are produced using a stereo pair of successive photos along a flight line. The image orientation is dependent on the direction of the flight line. For example, north-south flight lines will have an anaglyph with west orientated to the top. East-west flight lines will have an anaglyph with north oriented to the top. I anticipate using anaglyph images of the stereo models during my testimony.

### **Photointerpretation and Mapping**

Photointerpretation of the Site was conducted on the digital stereoplotter using the same digital stereo models used to produce the digital orthophotos. The digital stereoplotter permits a view of the Site in 3-D on a stereoplotter monitor or large computer projection screen, normally at magnification factors ranging from 8X to 32X, while identifying and mapping the outlines of significant environmental features. When necessary to map very small features, Aero-Data Corporation can zoom to magnification factors as high as 128X. Generally speaking, zoom settings greater than 32X do not yield more detail, but they do help in carefully mapping small features.

### **Geographic Information Systems**

The rectified images were imported into the geographic information system (GIS) and features were annotated.

The images contain specific information which must be viewed by the reader in order to fully understand this report. They are included in Attachment A and constitute the primary source of information in this report. They were prepared so that they may be displayed using computer generated prints or a computer projection system. The GIS provides a wide range of capabilities such as zooming, turning themes (layers) on and off, georeferencing maps, and measuring distances.



## **MIDDLETOWN, CONNECTICUT**

### **SITE AREA AND LABELS**

The Middletown Facility (Site) is located in Middlesex County at 475 Smith Street in Middletown, CT. The Site is located on the southeastern corner of Middle Street and Smith Street. Sawmill Brook is visible to the east.

The Site Area has been overlaid on the Middletown 7.5' Quadrangle and the 7/27/2016 NAIP imagery.

A mapped image (Labels for Report) is included with features labeled on the 5/4/1976 imagery to facilitate the discussion within this report.

### **HISTORICAL AERIAL PHOTOGRAPHY**

#### **3/9/1970**

The facility is not yet visible. Vegetated fields are visible on the Site. By the next date of photography, 6/28/1970, construction activities will be visible on the Site.

#### **6/28/1970**

Construction activities including disturbed areas/earthmoving are visible.

#### **4/26/1972**

A building is visible with parking areas to the north, east and south. Vegetation/trees have been removed between the building and Middle Street.

#### **5/4/1976**

The building remains visible with parking areas to the north, east and south. The Non-Contact Cooling Water Recovery System (AOC #13) is first visible to the northwest of the building near the intersection of Smith Street and Middle Street.

#### **11/3/1981**

A building addition is visible for the first time south of the existing building. New fill material and expanded parking areas are visible southeast of the building. An additional new parking area is visible south of the building. A drainage feature is visible east of the building and drains towards Sawmill Brook. The Non-Contact Cooling Water Recovery System (AOC #13) remains visible.

#### **3/8/1986**

The drainage feature remains visible east of the building and drains towards Sawmill Brook. Few cars are visible in the parking lots. This photograph was taken on a Saturday. The Non-Contact Cooling Water Recovery System (AOC #13) remains visible.

#### **4/19/1990**

Few cars are visible in the parking lots. This photograph was taken on a Thursday.

**4/20/1995**

The drainage feature is visible east of the building and drains towards Sawmill Brook. Few cars are visible in the parking lots. This photograph was taken on a Thursday.

**7/27/2016**

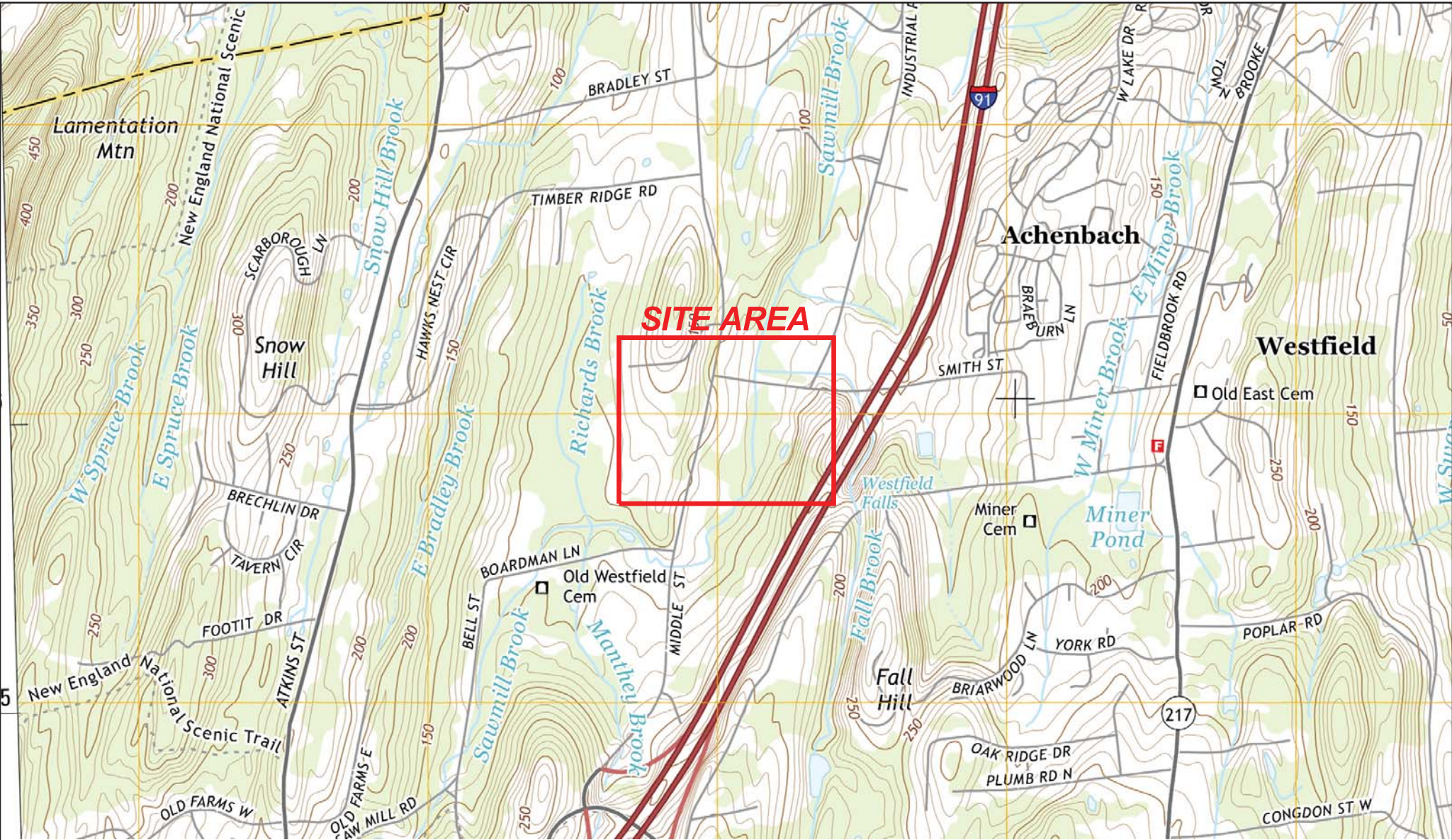
The building remains visible with cars present in the parking lot.

DOCUMENT/ PHOTO DATE	DOCUMENT/ PHOTO SOURCE	PHOTO RATIO	FILM TYPE	ROLL NUMBER	FRAMES FOR PROJECT	DESCRIPTION	RESEARCH STATUS
1/1/1965	USGS		MAP			Middletown 7.5' Quadrangle (Revised 1992)	Received
3/9/1970	UCONN	20000	BW		3119-31202966-2967	Aerial Photography	Received
6/28/1970	USGS	54000	CIR	3	13-14	Aerial Photography	Received
4/26/1972	USGS	76000	BW	1	21-22	Aerial Photography	Received
5/4/1976	USDA	38000	BW	276	8-10	Aerial Photography	Received
11/3/1981	USDA	40000	BW	478	253-254	Aerial Photography	Received
3/8/1986	UCONN	6000	BW	44, 45	44:3027 45:3096	Aerial Photography	Received
4/19/1990	UCONN	20000	BW	44, 45	44:3220-3221 45:3241-3242	Aerial Photography	Received
4/20/1995	UCONN	20000	BW	43	49-50	Aerial Photography	Received
3/15/2006	MACTEC					Phase III Invegtigation Report	Received
5/23/2012	USGS		MAP			Middletown 7.5' Quadrangle	Received
5/29/2015	USGS		MAP			Middletown 7.5' Quadrangle	Received
7/27/2016	USDA-NAIP		COL		1 METER Middleton, NW, SW	Aerial Photography	Received

## ***Site Area and Labels***

***Middletown, CT***





7.5' Quadrangle  
Middletown, CT  
Map Source: USGS

Middletown, CT  
7.5' USGS Quadrangle



500 0 500 Feet







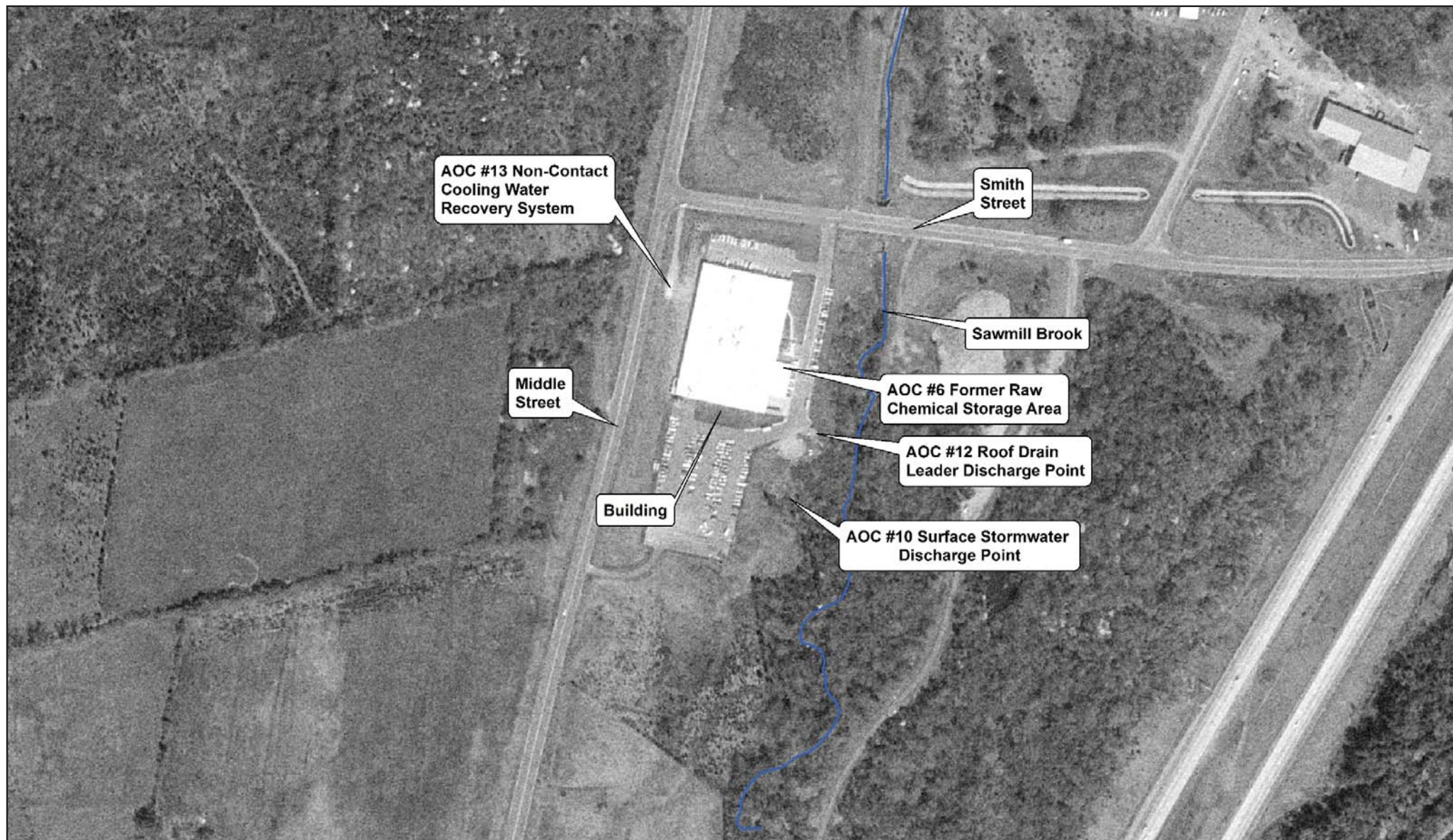
**7/27/2016**  
**Middletown, CT**  
Photo Source: USDA\_NAIP



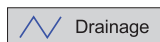
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5/4/1976  
Middletown, CT  
Photo Source: USDA



*Labels for Report*



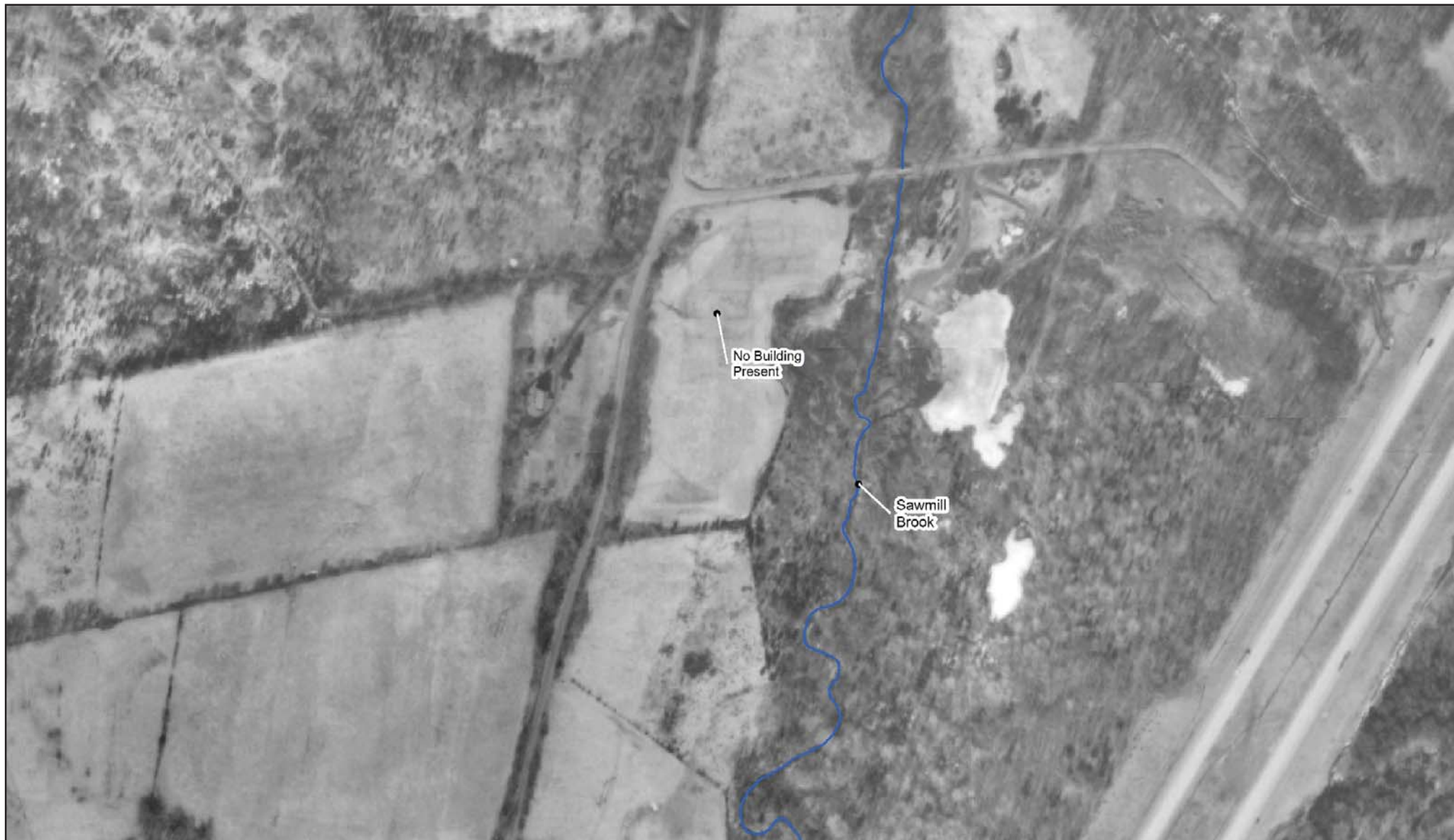
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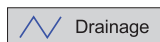
# ***Historical Aerial Photography***

***Middletown, CT***





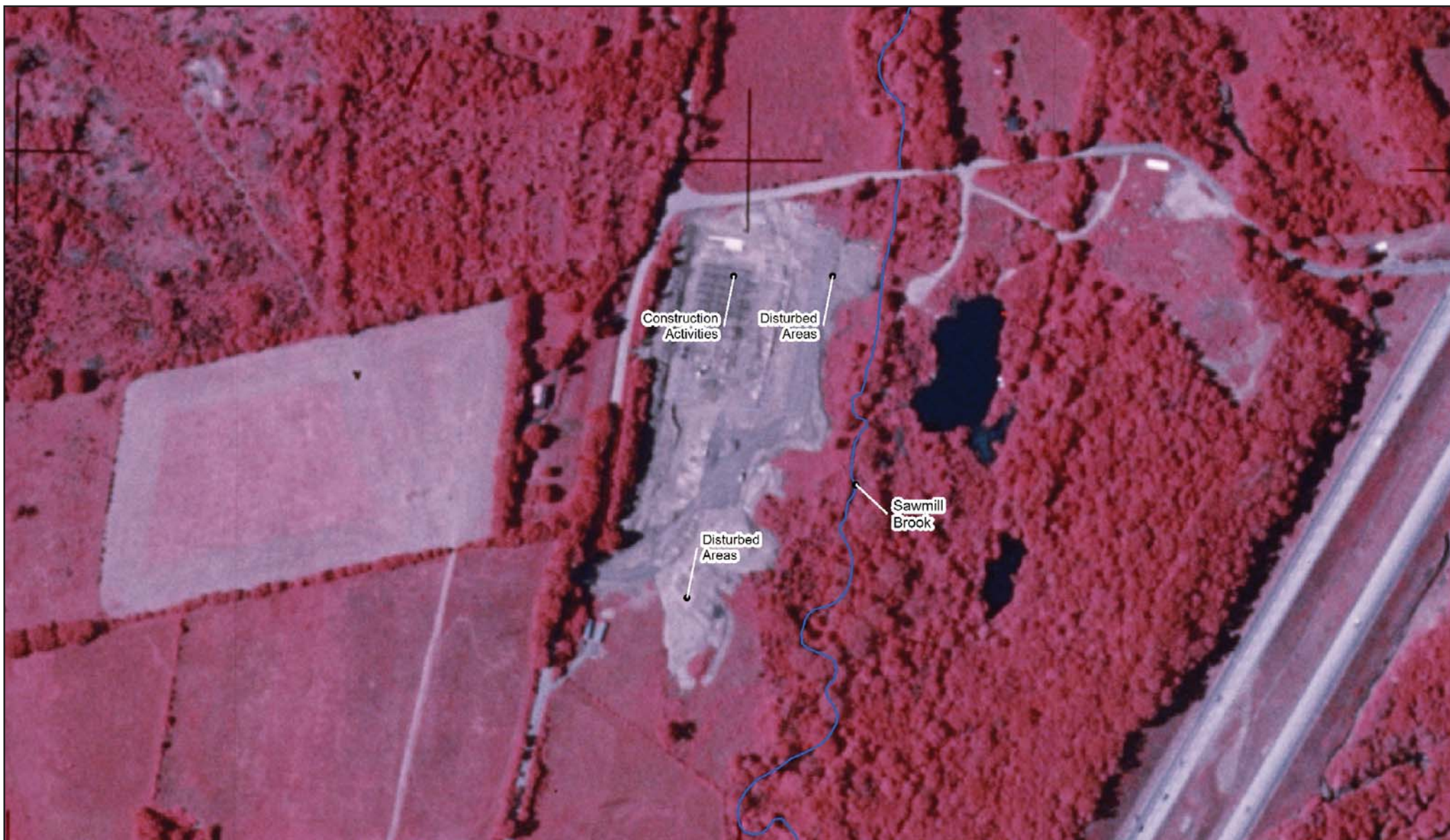
**3/9/1970**  
**Middletown, CT**  
Photo Source: UCONN



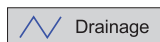
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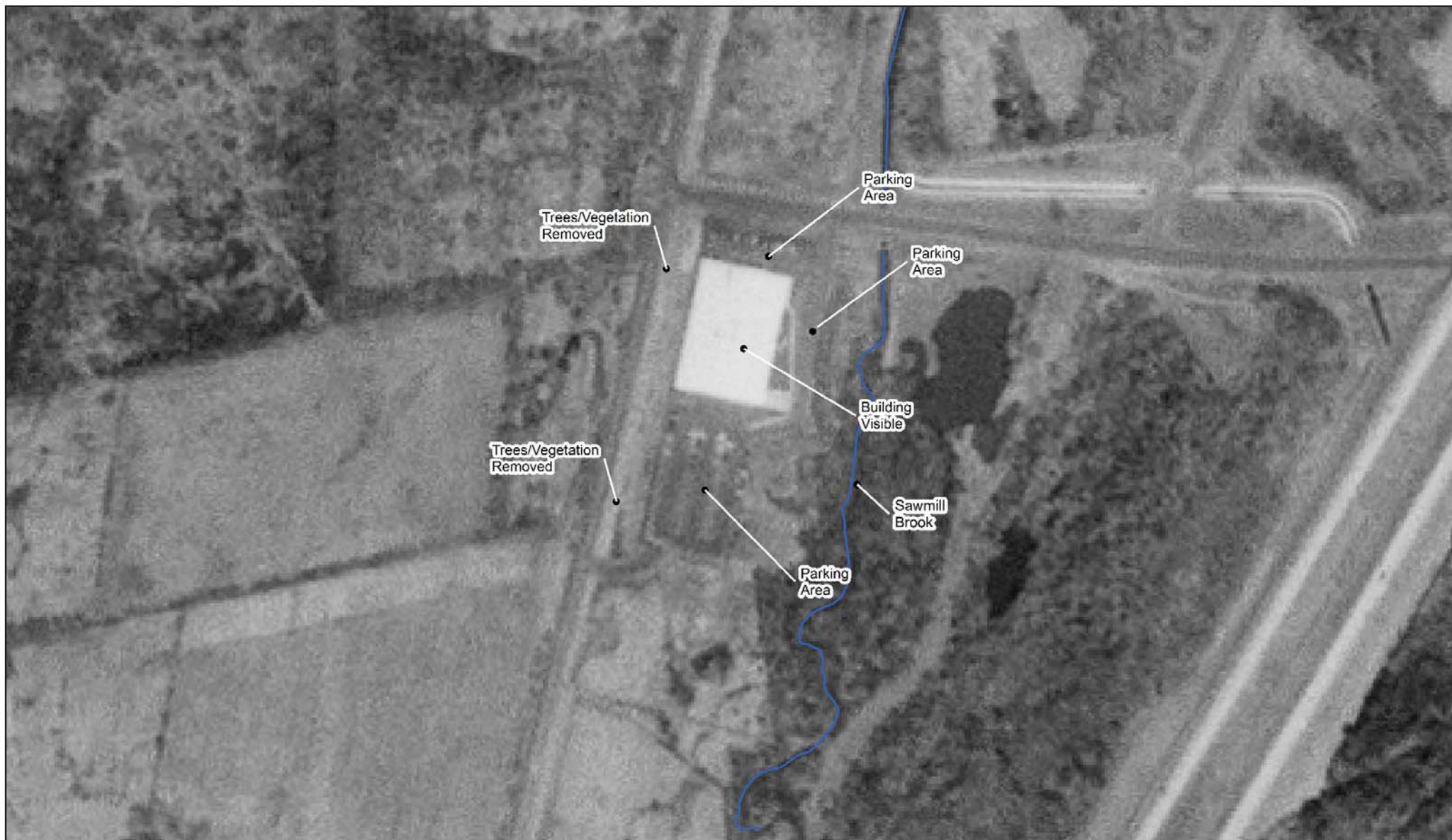
**6/28/1970**  
**Middletown, CT**  
Photo Source: USGS



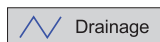
100 0 100 Feet

**AERO-DATA CORP.**  
ENVIRONMENTAL  
REMOTE SENSING CONSULTING SERVICES  
AERIAL PHOTO ACQUISITION  
INTERPRETATION and MAPPING





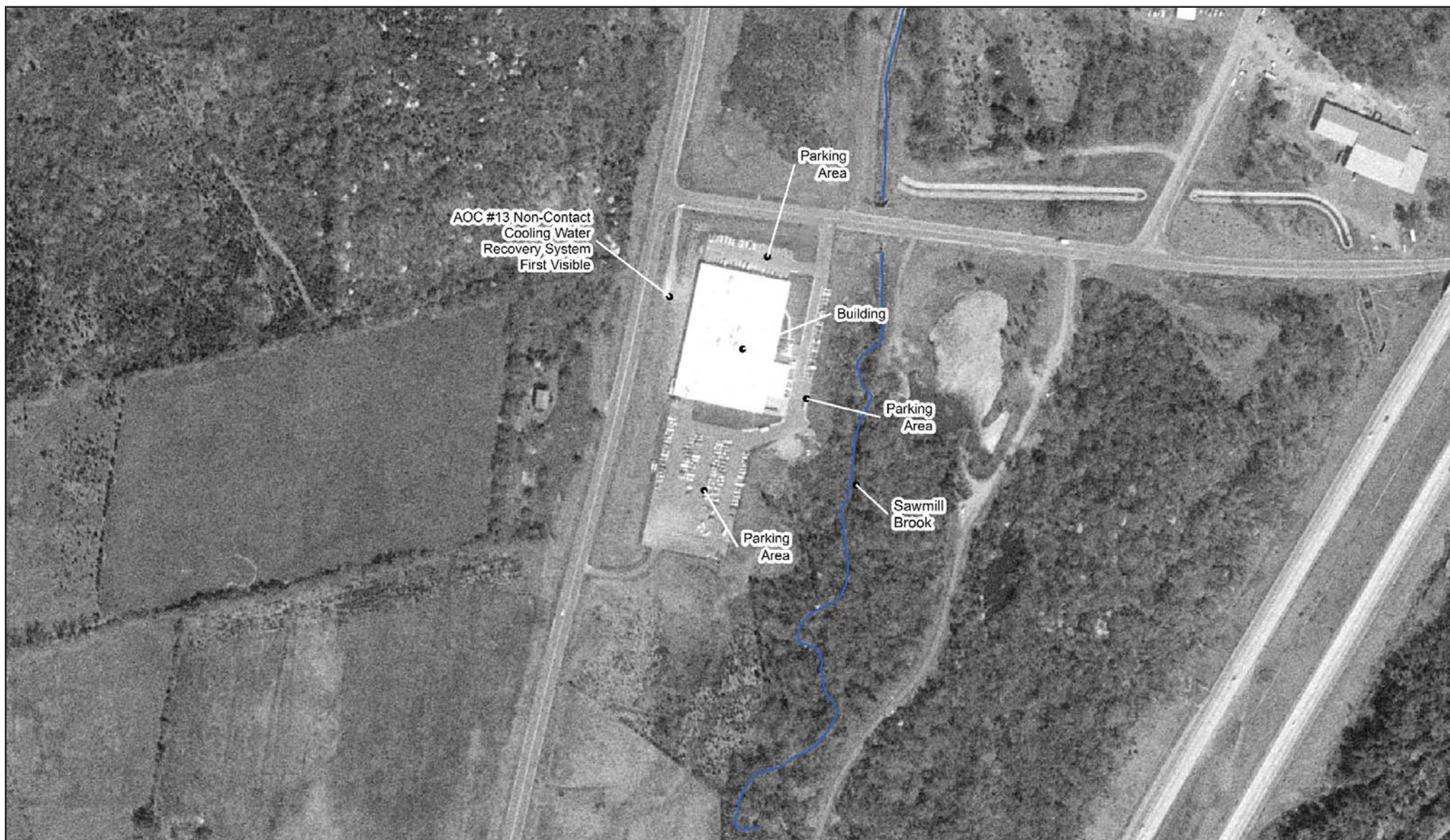
**4/26/1972**  
**Middletown, CT**  
Photo Source: USGS



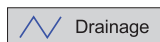
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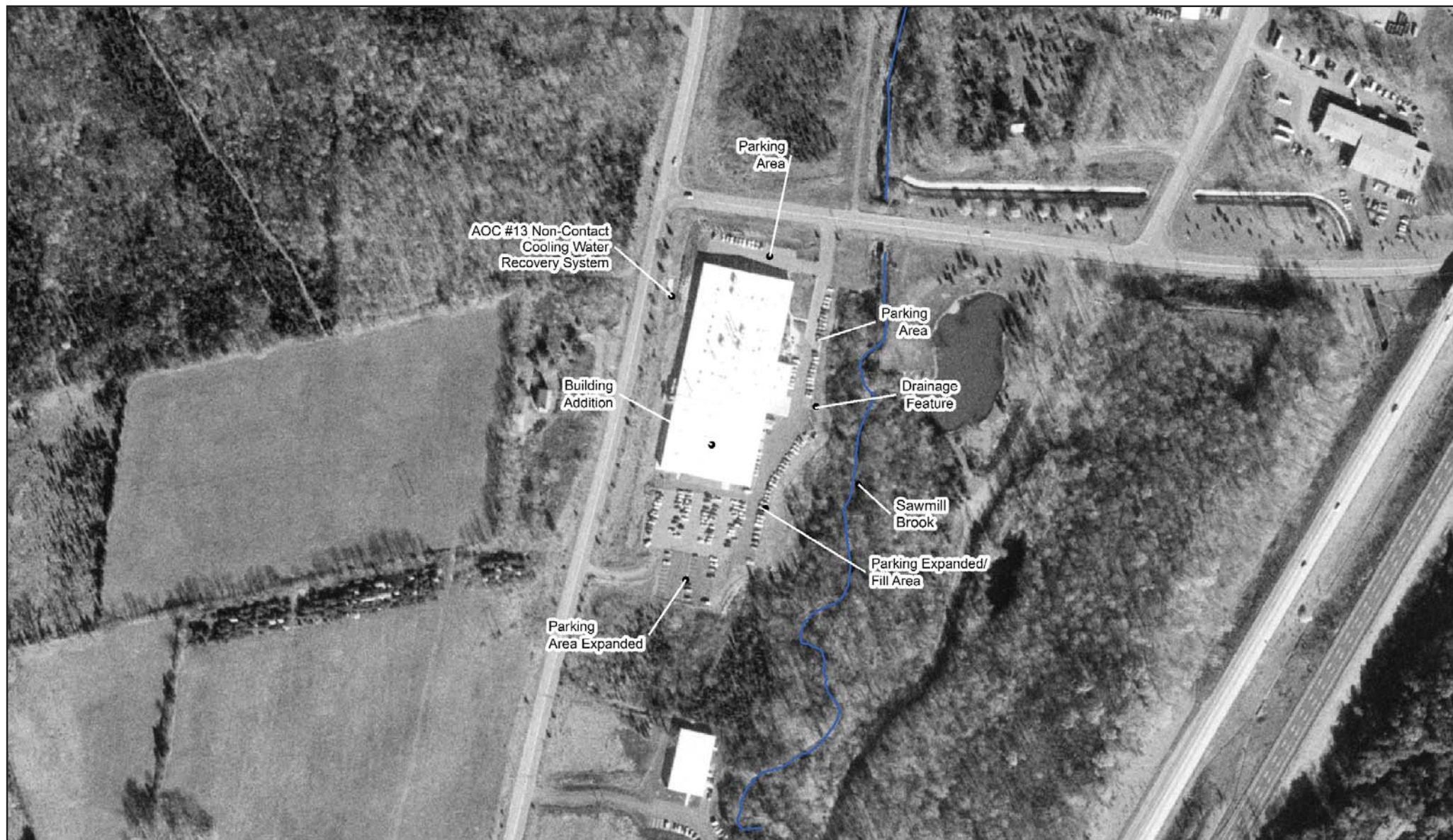
**5/4/1976**  
**Middletown, CT**  
Photo Source: USDA



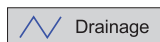
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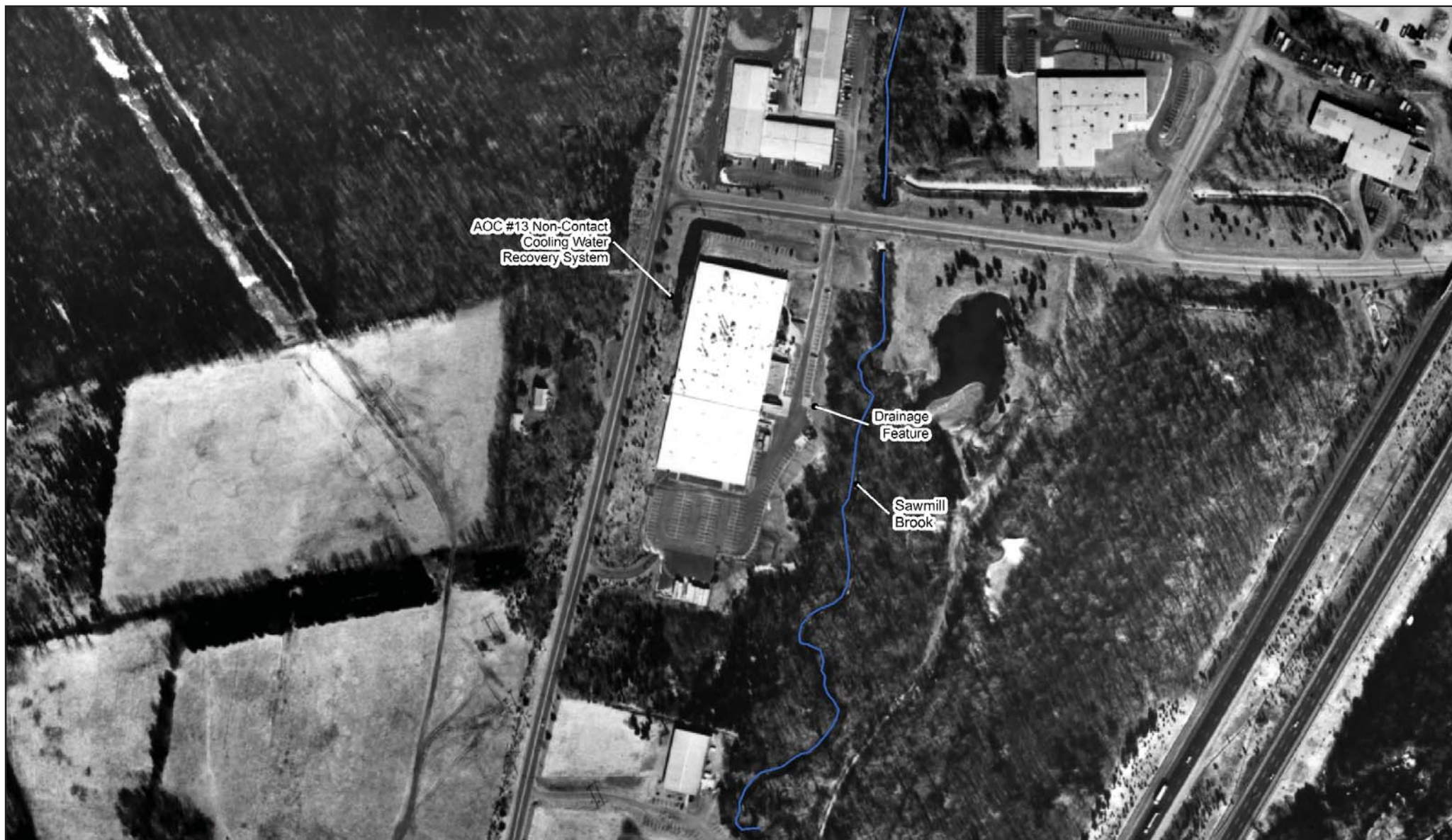
11/3/1981  
Middletown, CT  
Photo Source: USDA



100 0 100 Feet





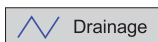


AOC #13 Non-Contact  
Cooling Water  
Recovery System

Drainage  
Feature

Sawmill  
Brook

3/8/1986  
Middletown, CT  
Photo Source: UCONN



100 0 100 Feet

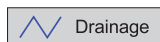
**AERO-DATA CORP**  
ENVIRONMENTAL  
REMOTE SENSING CONSULTING SERVICES  
AERIAL PHOTO ACQUISITION  
INTERPRETATION and MAPPING



4/19/1990

Middletown, CT

Photo Source: UCONN



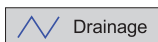
100 0 100 Feet







4/20/1995  
Middletown, CT  
Photo Source: UCONN



100 0 100 Feet







**7/27/2016**  
**Middletown, CT**  
Photo Source: USDA\_NAIP



100 0 100 Feet



# ***Maps***

***MIDDLETOWN, CT***

